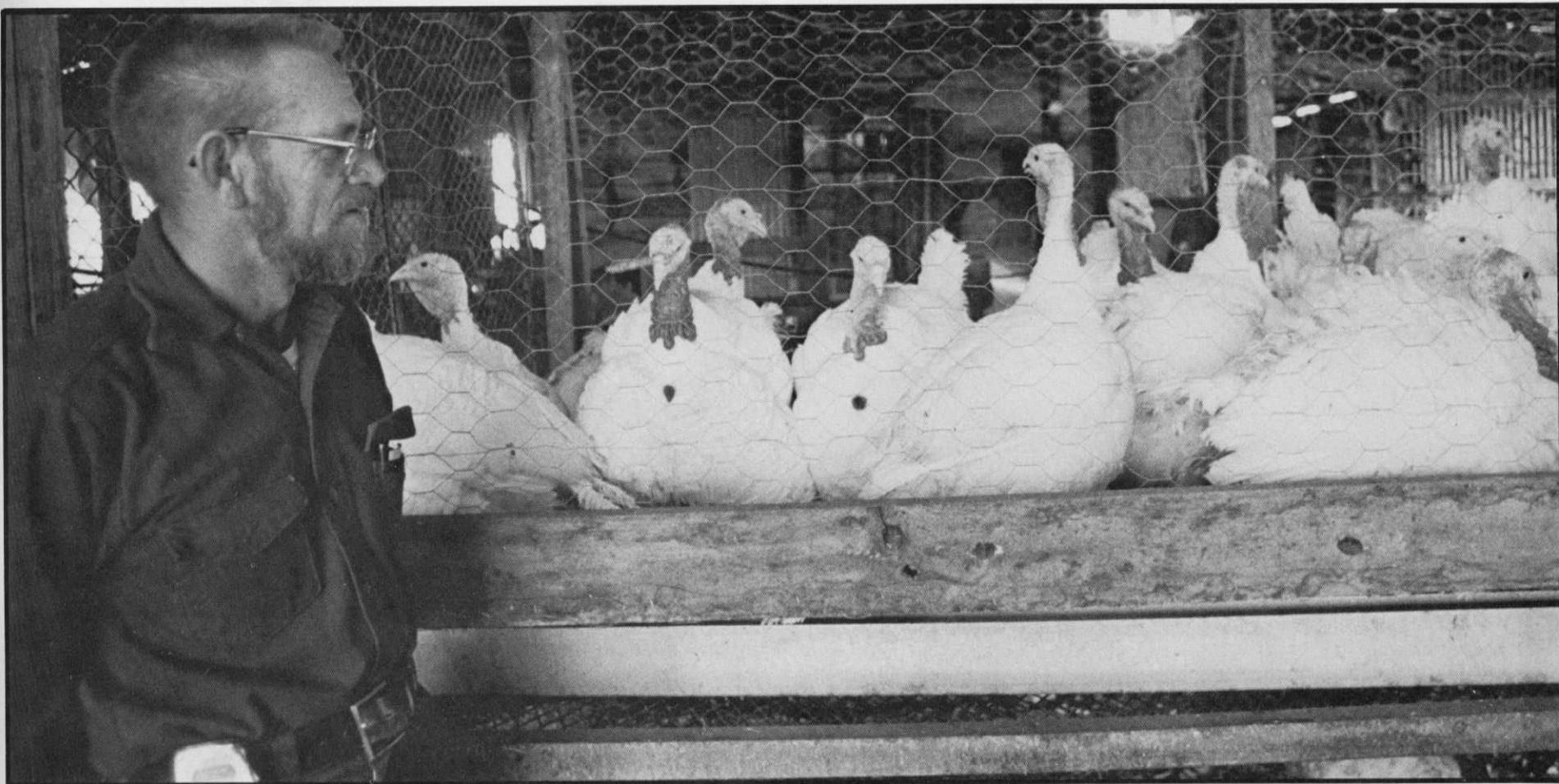


PACKARD ELECTRIC Cablegram

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GOBBLERS FOR GOBBLING — "Whitey" Wireman, supervisor, Grinnell warehouse, poses with some of the turkeys he raises each year for Thanksgiving. Story and related photo on Page three.

New Packard product for 1982

Carburetion makes way for TBI

by Michael Hissam

General Motors' use of a new fuel delivery system to replace the carburetor on certain engines means a new product for Packard Electric this model year.

Throttle Body Injection (TBI) harnesses are being produced at Packard for use on 4-cylinder 2.5 liter engines for Chevrolet, Buick, Oldsmobile and Pontiac, along with selected 8-cylinder engines for Chevrolet, according to Roger Phillips, application engineer, who has been working on the TBI project.

"TBI offers an efficient method for proper fuel economy. Fuel injection has been used in the past by GM, but this system is a more economical method of fuel injection. Since fuel delivery is completely controlled by electronics, only exact amounts of fuel are delivered for proper combustion at all engine operating conditions. TBI promotes improved fuel economy and driveability, while meeting stringent government emission control standards," Phillips said.

The hardware

Phillips pointed out that the TBI system uses a fuel injector that is mounted on a cast metal housing located on the engine's intake manifold replacing the carburetor. "The cast

metal housing also contains the throttle plate assembly, which is the origin of the name Throttle Body Injection. Also included in the package is an electric fuel pump located in the fuel tank, a series of engine sensors and an electric control module (ECM) located in the passenger compartment. The ECM controls the 'on' time of the injector, based on engine operating conditions received from various engine sensors."

How TBI works

Phillips explained that once the ignition of the car is turned on, the electric control module energizes the fuel pump which pressurizes the fuel system which makes it ready to deliver fuel. "Upon the cranking of the engine, the distributor sends a signal to the on-board computer telling it that energy is being delivered to the spark plugs. The computer then opens the injector, and fuel is sprayed into the intake manifold."

Once the engine is running, the computer receives information from various engine sensors (including coolant temperature, throttle position and engine vacuum) and the information allows the computer to adjust the "on" time of the injector to deliver just the right amount of fuel for all engine operating conditions. "The driver will notice more miles per gallon,

quicker acceleration and less hesitation in cold weather.

"There is also another advantage in that no adjustments are needed for the TBI system as had been needed for the carburetors," Phillips said.

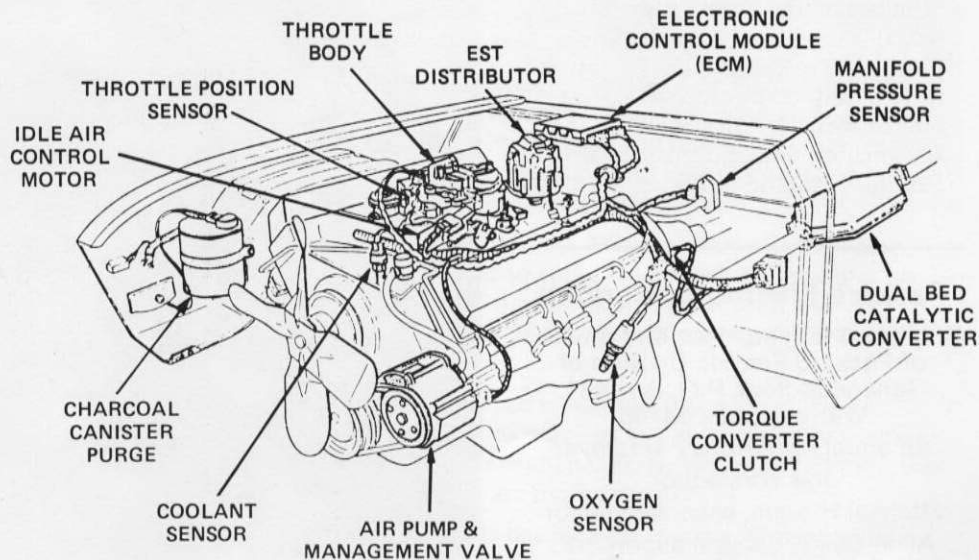
Packard's connection

"Packard's TBI harness becomes the link between the computer and all electrical devices associated with engine control systems," explained Bernie Flesch, Application Engineering.

"The job of our wiring is to transmit input information from various sensing devices to the computer. The computer responds to the changes in information and in turn signals a change to the control devices. This output signal is also transmitted by the Packard wiring system," Flesch said.

Reliability

Flesch added that TBI wiring is designed to specifications that approach (Continued on page 4)



NEW FOR '82 — GM's new Closed Loop Throttle Body Injection System (TBI) will replace conventional carburetion on many new model GM cars.

News - - briefs

Bond rating changes, GM responds

Moody's Investors Service recently lowered its senior debt ratings on GM bonds from AAA to AA, and in response to the above move, the corporation issued the following statement: "We are, of course, disappointed that Moody's has not maintained our AAA bond rating—which had been accorded our securities for decades and through all the recessions in the U.S. during that time. In any event, a AA bond rating indicates bonds of high quality by all standards. In this connection, it should be noted that of Fortune's 500 largest industrial companies in 1980, only 17 percent are accorded a AA rating or higher by Moody's."

"The change in the rating appears to reflect the unfavorable current and near-term conditions in the U.S. economy and in the U.S. automotive industry. These adverse conditions include the high level of interest rates which has suppressed the economy in general and automotive sales in particular. Further, the corporation's major capital spending program is placing a major claim on our current financial resources, but is geared toward the achievement of our longer-term strategic objectives."

AMC feeling the pinch?

"To relieve the immediate pressure on its cash flow from falling sales, AMC has arranged to delay paying bills from its two-dozen biggest parts suppliers for as long as 30 days," reports the *Wall Street Journal*. In the past, AMC has turned to Renault for financial help, but a Renault U.S.A. executive told the Journal that the French automaker has invested a "substantial amount, and now it's up to AMC to do certain things on its own and try to consolidate the situation. . ." Renault, which owns 46.4 percent of AMC's stock, already has provided the U.S. automaker with \$227.5 million in cash.

Free publications

The U.S. Government Printing Office is offering a variety of free publications to interested people, including two booklets that talk about energy usage and conservation. The first, "Tips For Energy Savers (#601J)" discusses ways to save energy at home and also lists average annual electrical usages for common appliances. The second booklet, "Understanding Your Utility Bills (602J)" shows how to read utility meters and calculate bills. To obtain these or any of the other booklets, offered write to: Consumer Information Center, Department B, Pueblo, Colorado 81009.

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'Pleased, surprised and pretty good'

Tinsmiths share maximum award

Three tinsmiths are the latest employees to share in the maximum \$10,000 suggestion award under Packard's employee suggestion program.

John Pettit and Roscoe Wareham, both of Dept. 913, and Don Knox, of Dept. 903, shared the award for their ideas to improve the design and produceability of a convoluted conduit applicator.

For Wareham, the maximum award is nothing new—he shared in a \$10,000 award in 1974.

According to Bob Gray, suggestion coordinator, the idea is primarily a refinement on an existing tool. Gray said, "We never really had a good conduit applicator for one inch conduit. This is new for us. Now there are more than 300 in use. Some form of this is in use at nearly all the remote plants."

Gray noted that the employees' suggestion saved more than \$50,000 worth of scrap, reoperations and fabrication by bringing the tool into production earlier than any engineering or casting firm could.

The men described the evolution of the applicator. Pettit said, "We developed the prototype from the hand-held applicator. Then, we came up with a custom design that would work." Although the first design was workable, it was made from seven separate pieces of stainless steel and required nearly 12 hours to complete.

Eventually, Pettit explained, the men came up with a simpler design made from only two pieces of stainless steel and which required only 45 minutes to complete.



SUGGESTION AWARD WINNERS Don Knox (standing left), John Pettit (standing right) and Roscoe Wareham (seated right) explain the evolution of their award winning idea to Lee Crawford, director, Warren Operations Assemblies.

The final design, however, was a one-piece casting which required only 1½ hours to complete and needed no special finishing.

Pettit noted, "We talked the idea over with Roscoe and decided we were all in it. It was a good idea—a cost saver and easy to build. About two months ago we began to think this might grow into a maximum award."

The men's reaction to the award? Knox said, "I was surprised it was \$10,000. I feel it is a very good program. This has been my big year in

the program." He noted that the award was his fourth of the year bringing his total suggestion earnings to approximately \$7,000.

Pettit said, "For awhile I didn't turn in any suggestions because I was disillusioned. But, over the years, on the average, the program has treated me rather well. I've had a number of awards, and I was surprised that this one was a maximum."

And, Wareham commented, "I was pleased, surprised and thought it was pretty good."

Propane storage tanks removed

An improved outlook for the availability of natural gas led to the recent removal of four propane gas storage tanks from the Warren Operations and the sale of 90,000 gallons of propane gas, along with related equipment.

John Good, energy coordinator, explained that no natural gas shortages are projected and that Packard gained not only from the sale of the propane and equipment, but also by avoiding future investment to upgrade the system

which included three tanks at North River Road and one at Dana Street. "Even if a shortage was to occur, Packard's natural gas supply could be supplemented by gas wells on General Motors' property in Lordstown."

Good explained that a Lordstown-based fuel group has agreements with all Ohio natural gas companies that deliver natural gas to GM plants in Ohio. "The agreement is that the Lordstown group will supply gas to a piping network to serve GM plants.

The exact allocation of this natural gas would be decided by GM in Detroit, based on production needs of the corporation."

Installed nearly 10 years ago, the recently removed system was designed as a backup in case natural gas systems would fail or if shortages of natural gas would occur. The propane would have been used for boilers and other processes dependent on natural gas, Good stated.



OLD AND IN THE WAY — Workers remove the old propane storage tank from Dana Street parking lot following sale of the tank and its contents. Three similar tanks were removed from near Plant 10.

Service, precision, quality are key

Speed-O-Matic supports sales

by Joe Tori

At first glance, the words Speed-O-Matic might suggest the latest refinement is cruise control or some slickly marketed vegetable slicer. In fact, Speed-O-Matic is the trade name for Packard tooling sold to non-allied customers which supports the sale of cable and other components.

Tucked away in the wall of Plant 12 near the ramp leading to Plant 14 lie the Speed-O-Matic operations. In conjunction with the Sales department the organization operates much like an independent business with more than a million dollar inventory, three technicians, and one engineer supporting more than 800 customers around the world.

To Doug Welker, Speed-O-Matic engineer, service is the key to Speed-O-Matic's success. "Our service is exceptional, we can set up a customer in seven to 10 days and have service parts out in 24 hours, if necessary." Welker continued, "Our technicians deal directly with the customer, troubleshooting over the phone and in some cases travelling directly to the problem site. For the people who purchase our components, we are willing to pull out all stops anywhere or anytime to get the job done."

Keith Digman, Speed-O-Matic technician, said, "Once our customers purchase our tooling, they are really sold. The quality of our tooling is

superior to that of our competitors. Speed-O-Matic dies are small and precise. This allows our customers to attach a great number of terminals without using much space. The precision of the dies allows a very high degree of reliability and repeatability. Most customers use Packard's quality control specs rather than set up their own, because ours are so stringent.

Bernie Diehl, also a Speed-O-Matic technician, said, "When a customer purchases a die or another piece of equipment, he is making work for us (Packard employees) by buying our terminals and connectors." Diehl added, "We all started out in the bargaining unit. It is almost essential to have that hands-on experience because we handle 10-20 trouble calls per day."

Claudia Reel, inventory technician, has the job of maintaining the inventory. Reel said, "This job is very challenging, but it does get hectic around model change."

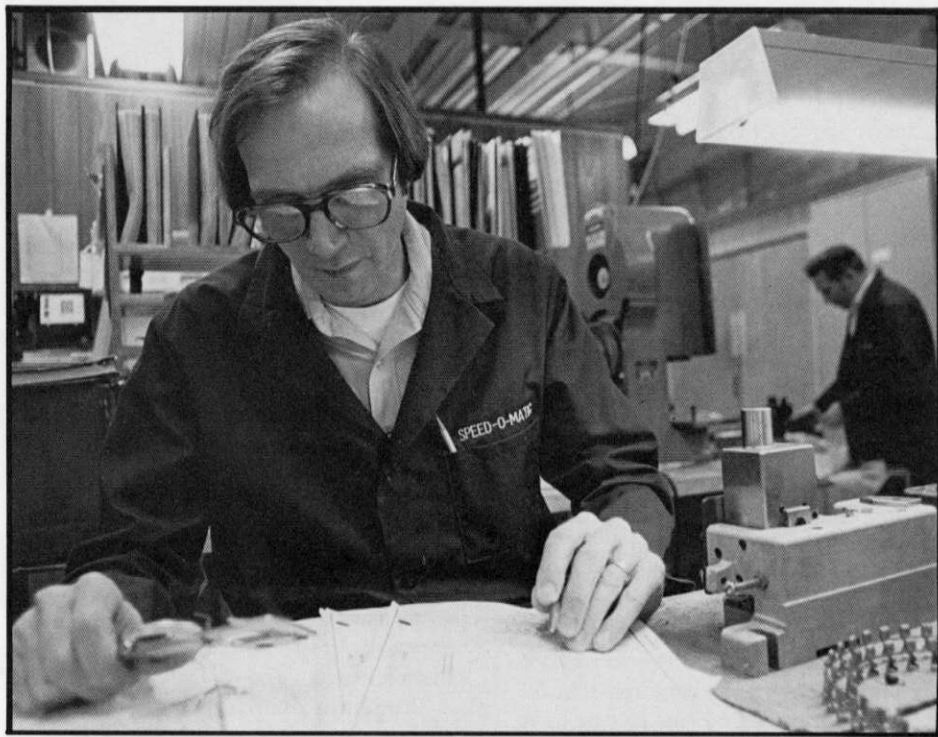
Sales Engineer, Dick Harries, noted, "Very often a customer or potential customer will come to us with a problem. We try to solve the problem using Packard components and tooling. Harries estimated that there may be as many as 1,000 presses and 2,500 dies in use by our customers around the world.

Welker also noted that the crib loans out dies to customers whose equipment is in for repair, and in emergencies, will support Packard in-plant tooling.

"Improved technology will play a large role in helping to support sales of cable and components. We are moving toward standardization of existing dies. In addition, we are working with new designs. The punchpack die, for example, utilizes a modular approach and can run about 100 different ring and spade terminals. The Metri-Pack

die is also designed to run a great many part numbers.

Welker closed by saying, "There is great potential for growth in this area. With our continued transition to component manufacturing and miniaturization, we will be able to support more non-allied business in the next five years than ever before."



SPEED-O-MATIC technician Bernie Diehl checks print specifications with an actual Speed-O-Matic die as technician Keith Digman readies a die for shipment.

He'll take one of his any day

'Whitey' Wireman talks turkey

by Joe Tori

In spring a young man's fancy may turn to love, but in the fall there are additional thoughts just as pervasive. Some of them are love, football, Thanksgiving and turkey.

Turkey is also one of the more pervasive thoughts in "Whitey" Wireman's fall. Wireman, supervisor Grinnell warehouse, raises turkeys for the Thanksgiving holiday . . . about 200 of them.

"This is the sixth year I've done this. I began it because I wanted good meat on my table," Wireman said.

Wireman buys his turkeys from a hatchery near Cincinnati. Wireman said, "As soon as they are hatched, they are boxed and shipped. Normally, they are less than 24 hours old when I receive them.

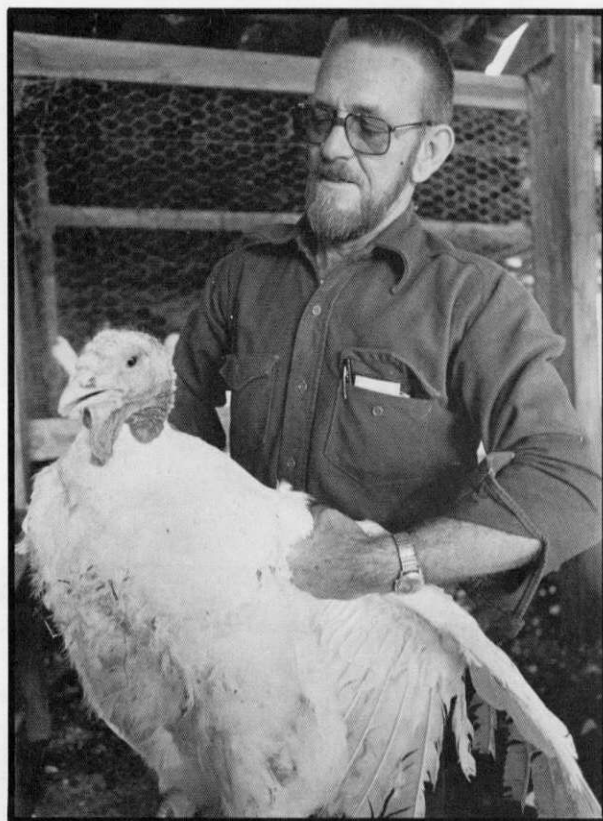
"I generally get a little over 200 per year, but this year I lost about 85 to disease early on."

Wireman noted that there are basically two types of turkeys, although the different hatcheries have various names for them. "You can buy either the heavy or light breed," he said. "The difference is in the size they reach."

He pointed out that hens of the heavy variety range in weight from 16 to 22 pounds, while the toms range from 20 to 35 pounds. Hens of the light breed weigh eight to 12 pounds while the light toms weigh 12 to 18 pounds.

"On any of these turkeys, the meat will be about the same," Wireman said. "The difference depends on how you feed them and how you finish them off. Around the middle of September, I start feeding them whole kernel corn. This puts some fatty tissue on them for the cooler weather and also plays a big part in how moist the meat will be. If they are not finished off on corn, then the meat could be dry."

Wireman explained that it takes between 24 and 26 weeks for a tom turkey to mature for optimum flavor. Hens, he said, require 22 to 24 weeks to mature. "I order the turkeys in the first part of January so I'll have them by the first part of June. I try to have them all finish off right around Thanksgiving."



SHOWING OFF — "Whitey" Wireman shows the breast size of one of homegrown hens.

Wireman then sells the turkeys from his farm in Vienna. "That way I don't have to refrigerate them," he said. "If I did any more I would need a walk-in cooler."

Wireman had the following recommendations for those planning to choose and prepare a turkey for the holiday.

"You have to consider the size of the turkey. You can figure about a pound per person. Also, look for fat in the chest and under the wings. If there is no fat, then you can pretty much tell that the turkey won't be moist."

Wireman noted that a lot of people say they can tell the difference between a hen and a tom by taste. However, he contends there is no real difference in taste. "The quality of the meat depends on how you feed them. If you feed them junk food, then that's exactly what you'll end up with."

Wireman explained that anyone buying a frozen turkey should put it in water for about an hour to thaw it correctly. "When you remove it, you should keep it covered with a damp towel to maintain the moisture. Otherwise it will dry out."

As for preparation, Wireman said a fresh turkey takes less time to cook. He estimated 15 minutes per pound at 325 degrees in an electric oven and approximately 10 minutes per pound at 325 degrees in a gas oven.

In addition, he mentioned that turkeys will be inexpensive this year—as low as 45 cents per pound—because they are abundant. He observed, however, that fresh turkeys are more expensive.

And, of self-basting type turkeys, Wireman said, "We used to get one of those once in a while. I might be prejudiced, but I'll take one of my turkeys any day."

Great American Smokeout . . .

MISS HOSPITALITY of Mississippi, Patra Massey, reaches for help in the form of a cookie at the "Crisis Center" during the Great American Smokeout, held Thursday, November 19. The center was set up to help those Brookhaven employees who quit smoking during the one-day event held at Packard's Mississippi facility. Nurse Betty Cothorn and unidentified assistant look on.

Throttle Body Injection system replaces conventional carburetion

(Continued from page 1)

"space age" technology for reliability. "Electric spark timing circuits call for twisted and shielded cable to protect electronic components from electromagnetic interference. In addition, we use sealed connection systems with positive locks in the engine compartment. There are also redundant circuits as backups, just in case. Laboratory and fuel testing have verified the harsh standards of reliability in the Packard TBI wiring product."

New technology and quality

Addition of the TBI product also saw implementation of associated new technology, according to Nick Bozich, formerly chief engineer, Application Engineering, and now manager, Plants 41, 42, 44 and 45. "With TBI, an injectible hard-shell grommet replaces the conventional molded-on grommet. Plastic parts for the harness are assembled on the conveyor line, a foam gasket is added and the product is

injected with hot-melt glue. The gasket provides a seal to the sheet metal, while the hot melt creates a seal on the harness bundle itself."

"Final assembly lines for TBI used the Hybrid Integrated Production System (HIPS) technology which was very successful on the engine control harnesses in the 1981 model year, Bozich noted.

"Emphasis on quality is present on all aspects of the product. The TBI build board features a solid state 'ring out' system known as Cablesan, which 100 percent checks for electrical continuity and complete electrical integrity of the wiring harness. If any part of the harness is of questionable quality, the departments involved with that part meet to review the problem, obtain information to make a decision, check to make sure corrective action has been performed and document what has happened. Quality and reliability of the TBI system are essential for the continuity of the system," Bozich stressed.

X-cars, T-cars now eligible for refund/Class A programs

Introductions of 1982-model X- and T-cars and S-trucks by General Motors also increase the number of 1982 models for which Packard employees may be eligible for refunds or maximum product discount (Class A).

With these latest introductions, refunds and discounts for 1981 model vehicles may be obtained only on the Chevrolet Camaro or Pontiac Firebird.

Al Jordan, supervisor, benefit plan administration, advised hourly

employees to make sure the vehicle is eligible for a refund before applying.

Tom Habel, Salaried Benefits, issued the same advice for salaried employees seeking to order, or to purchase a vehicle from dealer stock, under the Class A plan. The cut-off date for purchasing under Class A from dealer stock is Dec. 31.

A chart showing the 1982 models eligible for refunds and discounts is printed on this page.

1982 models now eligible for refunds

\$235 Refund

Chevrolet — Chevette, Cavalier, Citation, Malibu Classic, Monte Carlo

Pontiac — T-1000, J-2000, Phoenix, Bonneville, Grand Prix

Oldsmobile — Omega, Cutlass Supreme, Cutlass Cruiser

Buick — Skylark, Regal

Cadillac — Cimarron

Chevrolet Truck — Blazer, Sportvan, Chevy Van, Chevy Van Chassis, LUV Pickup, El Camino, S-10

GMC Truck & Coach — Caballero, Diablo, Jimmy, Rally Wagon, Vandura, S-15

\$360 Refund

Chevrolet — Impala, Caprice

Oldsmobile — Delta 88, Ninety-Eight, Toronado, Custom Cruiser

Buick — LeSabre, Riviera, Electra, Estate Wagon

Cadillac — all except Limousine

Chevrolet Truck — Suburban, Pickup, Motorhome Chassis

GMC Truck & Coach — Suburban, Pickup, Motorhome Chassis

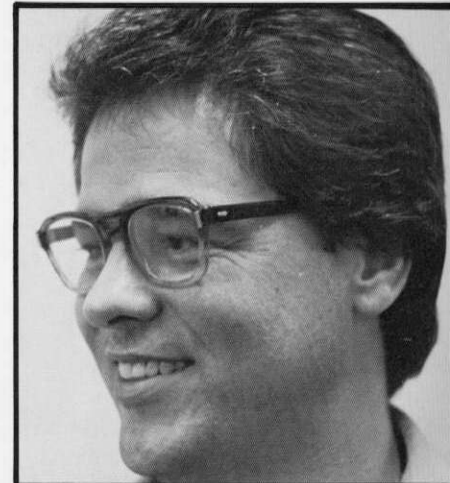
Packard probe

QUESTION: What benefit, if any, do you feel can be gained from GM's recently formed partnership with Suzuki and GM's long-standing association with Isuzu in Japan?

Charles Evans

Dept. 901

"I would say mainly the quality standards, or quality control. Maybe we can learn something from the Japanese as far as that is concerned. From what I've seen of their products, they seem to have a good quality control program."



Evans



Turner

Doris Turner

Dept. 4044

"I think we can learn a lot from them, because they're doing something right and evidently we're doing something wrong."

Nancy McLean

Dept. 153

"I think we can share some information and gain some new technology by working with the Japanese companies."



McLean



Eckman

Dave Eckman

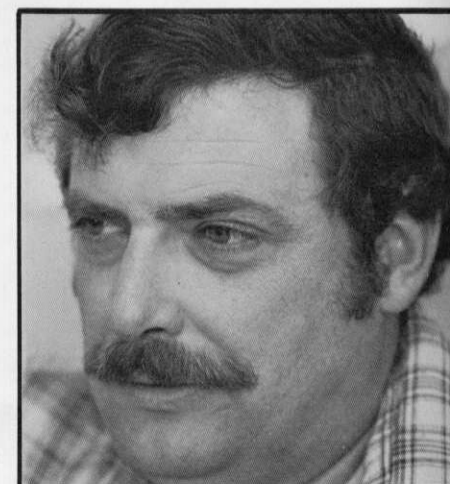
Dept. 2345

"We can share a lot of technology in the small car and truck fields. That's the way business is going to survive — going to a world-wide concern."

Ken Kendrick

Dept. 2076

"There is the possibility of an exchange of ideas on management techniques between Japan and here, as well as the obvious opportunity for sharing technology."



Kendrick